fracture till union is achieved. This was once again failure of the cable-plate implant system.

Out of six cases of type C fractures, three cases had fixation with Dall Miles plating system out of which two cases had further fractures below the tip of the plate in highly osteoporotic bones, requiring re fixation. The remaining three cases treated with Cannulock femoral stems went into union without loss of fixation or implant failures.

Summary: Dall Miles or Mennen plate systems used alone is insufficient treatment for periprosthetic femur fractures in elderly patients with poor bone quality. Failures of fixation or union are disastrous in this age group. This group of patients are best treated with single best possible surgery with favourable outcome.

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Management of periprosthetic femoral fractures using cannulok revision femoral prosthesis—A case series

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As total hip replacements have been increasing in numbers over the last decade, periprosthetic fractures are becoming more frequent. When these are associated with a loose stem and severely deficient or comminuted bone, it results in highly demanding revision surgery.

If the fracture is associated with loosening, the stem should be revised. We present a series of patients in which were treated with the Cannulok Revision Prosthesis (Orthodynamics, Christchurch, Dorset). This is a modular titanium, HA coated, revision prosthesis with distal locking comparable to an intramedullary nail, ideally allowing early full weight bearing and rehabilitation.

Since 1997 the senior author has performed over 270 revision operations; the Cannulok Revision Stem has been used in 10 patients. All patients had 2b or 2c periprosthetic fractures and had undergone a minimum of two previous hip operations. The minimum follow up time is 24 months and mean 36 months. One patient died of unrelated causes. Of the remaining patients three needed a revision because of implant failure. In these cases the fracture united, but the proximal femur failed to integrate. The implant has been modified and now has a more porous titanium surface.

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Stimulation of the inflammatory system by femoral intramedullary nailing: The source of the 'second hit'

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Hypothesis: Femoral nailing has been shown to cause a significant release of inflammatory mediators implicated in the pathogenesis of ''acute respiratory distress syndrome'' (ARDS) and post-traumatic sepsis. The source of the systemic response seen after femoral nailing is as yet unknown. The aim of the study was to evaluate whether the source of mediators delivering the second hit phenomenon is the femoral canal per-se, being delivered to the systemic circulation during intramedullary instrumentation.

Materials and methods: Between 2001 and September 2003, adult patients with femoral shaft fractures, requiring intramedullary nailing, were prospectively recruited for the study. Exclusion criteria included open fracture, elderly patients (>65 years), pathological fractures and patients with proven systemic inflammatory diseases (e.g. rheumatoid arthritis, diabetes). Based upon the day of admission, stabilisation of the femur was performed with either reamed or unreamed technique. Blood samples were collected on admission and at specific time points during the operative procedure. In the operating theatre blood samples were taken at induction of anaesthesia from the periphery, and from the femoral canal with a catheter at initial entry into the canal, after reaming (if performed) and at the end of the nailing procedure. At the same time points, peripheral blood samples were taken. Peripheral blood samples were subsequently collected on days 1, 3, 5 and 7 post operatively. Serum and plasma obtained were analysed for the concentration of interleukin-6. Clinical course of the patients and development of ARDS, sepsis and MOF was monitored daily to allow correlation with measured cytokine concentration. IL-6 levels were obtained using cytometric bead array kits (Pharmigen) by flow cytometry. In order to assess the normal concentration of IL-6 in the femoral canal, blood samples were drawn from six healthy controls who underwent total hip replacement. Statistical analysis was performed using Graphpad Instat V3 for Apple MAC.

Results: Out of 28 patients studied, 17 were males and 11 females. The mean age was 37.5 years (16—64), the mean ISS score was 16.05 (9—29). All femoral fractures were stabilised within 12 h of

injury. Twelve patients were subjected to reamed nailing and the rest to unreamed nailing. The mean control (patients undergoing total hip replacement) femoral IL-6 concentration was 9.6 pg/ml. In femoral canal samples from trauma patients, the initial IL-6 concentration at canal entry was significantly higher at 9348 pg/ml, and increased significantly following reaming to 17,925 pg/ml. At the same time points the IL-6 concentration in peripheral blood samples were significantly lower at 123.65 and 136.72 pg/ml respectively ($p = 0.001$). At 24 h, the peripheral IL-6 concentrations raised significantly from 162.7 to 799.8 pg/ml, illustrating the second hit insult. These values were also significantly higher than those measured in the unreamed group at all time points ($p < 0.001$). Two patients in the reamed nailing group developed ARDS following the procedure. There was no mortality in any group.

Conclusion: This data illustrates that reaming of the femoral canal results in significantly higher local and peripheral IL-6 concentrations. Femoral canal instrumentation represents a significant source of inflammatory mediators, propagating a second hit effect as expressed systemically. In multiple injury patients, these findings should be considered when determining the treatment plan to avoid inflicting further harm.

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Osteotomy of the femoral neck for severe slipped capital femoral epiphysis

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Introduction: The management of severe slipped capital femoral epiphysis remains controversial. Slipped capital femoral epiphysis tends to occur at an age when the child has limited potential for remodelling. It is recognised that outcome of the disorder is related to the severity of the slip. Severe slips have a high risk of undergoing degenerative change within 15 years. Osteotomy of the femoral neck aims to reduce the deformity and improve function and long-term survival of the hip.

Aim: To assess the short-term outcome of patients who have had an osteotomy of the femoral neck at the level of the physis for severe slipped capital femoral epiphysis.

Materials and methods: From 2000 to 2005, 10 patients underwent a femoral neck osteotomy at the level of the physis for severe slipped capital femoral epiphysis. All presented with pain and inability to weight bear. Diagnosis was confirmed with anteroposterior and lateral radiographs of the hip. The procedures were all carried out via a Smith—Peterson approach and a subcapital osteotomy performed to allow reduction of the epiphysis. Fixation was with a single cannulated screw. Postoperatively the patients were non-weight bearing for 6 weeks then partial weight bearing for a further 6 weeks.

Patients were assessed clinically and radiographically at follow-up.

Results: To date patients have been followed up for a mean of 22 months (range 2—48 months). Two patients (two hips) suffered avascular necrosis (10%); the clinical outcome was unsatisfactory. Of the remaining eight patients (eight hips) there were no cases of chondrolysis. These patients considered their outcome satisfactory.

Conclusion: The rate of avascular necrosis of 20% is within the range quoted in other series of intracapsular osteotomies of various types (4.5—35%). In our series subcapital osteotomy gave satisfactory clinical and radiographic outcome in 80% at a mean of 22 months follow-up. We suggest this one satisfactory option in the management of severe slipped capital femoral epiphysis.

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Early active treatment of femoral shaft fractures in children—A proposed protocol

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The aim of this study was to compare the modern treatments for traumatic femoral shaft fractures in children to traditional treatments. We studied 66 children who had sustained a fracture, over a 6-year period. A protocol using early hip spicas (EHS) for under 5 year olds, flexible intramedullary nails for over 5 year olds, and external fixation (ExFix) for the polytrauma cases was started in 1999. Over a 3-year period, 25 children sustained a fracture (early active group) and were prospectively followed up for a minimum of 24 months. The outcome measures being, length of hospital stay, degree of mal-union, range of hip and knee movement, leg length discrepancy, pain and functional restrictions. This group was compared with all fractures in the 3 years prior to the new protocol (traditional group, $n = 41$) which were treated with in patient traction.